AEI 1010 COMPUTER SYSTEM

a modular design
completely adaptable
to your expanding
data processing needs

AEI

AEI **Electronic Data Processing**

CONSPECTUS OF AEI 1010 COMPUTER & ASSOCIATED EQUIPMENT

	EQUIPMENT	LENGTH	WIDTH	HEIGHT	WEIGHT	SUPPLY VOLTAGE	CONSUMPTION	DISSIPATION
1	ARITHMETIC UNITS, Cubicles 'A' & 'B' with Control Desk	80.0 ins	25.0 ins	79.5 ins	1400 lbs	From Cubicles P & Q	2900 VA.	2070 W.
2	POWER UNITS, Cubicles 'P' & 'Q'	53.0 ins	25.0 ins	79.5 ins	1800 lbs	From Mains & M/A Set		
3	MOTOR ALTERNATOR SET 18KVA with Starter	111.0 ins	24.5 ins	25.875ins	2200 lbs	From Mains		
4	CDM2 DRUM Cubicle 'C'	26.5 ins	25.0 ins	79.5 ins	560 lbs	From Mains (AC) From P & Q (DC)	490 VA.	340 W.
5	DECCA 3000 TWIN TAPE UNIT	49.625ins	38.0 ins	68.0 ins	1250 lbs	From Mains	4KVA.	3200 W.
6.	DECCA CONTROL, Cubicle 'D'	26.5 ins	25.0 ins	79.5 ins	500 lbs	From P & Q (AC & DC)	910 VA.	670 W.
7	AMPEX TM2 ½" TAPE DECK (on dolly)	39.5 ins	23.0 ins	77.75ins	500 lbs	From Mains	2KVA.	1600 W.
8	AMPEX CONTROL, Cubicle 'G' (Control for 2 decks)	26.5 ins	25.0 ins	79.5 ins	500 lbs	From P & Q (DC)	820 VA.	585 W.
9	C.R.P.1. PAPER TAPE READER	26.5 ins	25.0 ins	79.5 ins	550 lbs	From P & Q (AC)	1KVA.	800 W.
10	CREED 75 TELEPRINTER (with attachments)	18.875ins	21.0 ins	13.0 ins	63 lbs	From P & Q (AC)	100 VA.	80 W.
11	CREED 3000 PAPER TAPE PUNCH	38.0 ins	18.0 ins	42.0 ins	320 lbs	From P & Q (AC)	660 VA.	500 W.
12	ELLIOTT B.46 CARD READER	41.0 ins	21.0 ins	36.0 ins	295 lbs	From P & Q (AC)	250 VA.	205 W.
13	ICT CARD PUNCH	48 0 ins	23.0 ins	49.0 ins	672 lbs	From P & Q (AC)	1100 VA.	800 W.
14	ANELEX LINE PRINTER	63.5 ins	29.5 ins	54.5 ins	1500 lbs	From Mains	2KVA.	1600 W.
15	FRIDEN FLEXOWRITER	17.5 ins	20.0 ins	10.0 ins	85 lbs	From P & Q (AC)	100 VA.	80 W.
16	XERONIC LINE PRINTER, comprising:-							
	(a) PRINT HEAD	70.0 ins	55.0 ins	81.0 ins	2250 lbs	From Mains 240v Single Phase	12KVA.	7 KW.
	(b) LOGIC BAY	48.0 ins	22.0 ins	74.0 ins	900 lbs			
	(c) AUXILIARY UNIT	63.0 ins	33.0 ins	69.0 ins	900 lbs			
	(d) CUTTER & STACKER	54.0 ins	36.0 ins	48.0 ins	450 lbs			
17								
18								
19								
20								
21	CUBICLE 'E' comprising:- 12 Buffer & 2 Stabilizer Chassis positions	26.5 ins	25.0 ins	79.5 ins	500 lbs	From P & Q (DC)		
22	TAPE READER BUFFER MK 2 (3 Chassis positions) each	19.5 ins	11.0 ins	8.75 ins	Incorporated in total weight of Cubicle 'E'	"	225 VA.	150 W.
23	CREED 75 TELEPRINTER BUFFER (1 Chassis position) "	"	"	"		"	60 VA.	40 W.
24	CREED 3000 TAPE PUNCH BUFFER (2 Chassis position) "	"	"	"		"	180 VA.	120 W.
25	ELLIOTT B46 CARD READER BUFFER (2 Chassis position) "	"	"	"		"	160 VA.	100 W.
26	I.C.T. CARD PUNCH BUFFER (2 Chassis position) "	"	"	"		"	130 VA.	85 W.
27	ANELEX LINE PRINTER BUFFER (3 Chassis position) "	"	"	"		"	240 VA.	165 W.
28	FRIDEN FLEXOWRITER BUFFER (2 Chassis position) "	"	"	"		"	60 VA.	40 W.
29	XERONIC LINE PRINTER BUFFER (3 Chassis position) "	"	"	"		"	270 VA.	170 W.
30								
31								
32								
33								
34	STABILIZER BUFFERS (2 Chassis position) "	"	"	"		"	included in above	
35	TRANSFORMER/REGULATOR (Typical - for Decca or Ampex)	28.75 ins	22.0 ins	84.25 ins	1100 lbs	From Mains	varying with load	
36	SUPERVISORS' DISPLAY	28.0 ins	28.0 ins	57.75 ins	180 lbs			
37	SUPERVISORS' DESK	54.125ins	30.0 ins	41.0 ins	100 lbs			
38	TYPEWRITER STAND	28.0 ins	28.0 ins	35.0 ins	130 lbs			
39	CUBICLE END COVER	27.0 ins	1.75 ins	72.25ins	54 lbs			

NOTE: 1. All Cubicle heights include 3 inch plinths.
Each Cubicle weight includes 20 lbs for plinths

2. Floor Loading: 300 lbs. per square foot
Point Loading: 500 lbs. (excluding Xeronic)

3. Electrical Requirements :-
415 volts ± 6% 3 Phase. 50 Cycle. 3 wire System

240 volts. Single Phase System

4. When Cubicles are in line, add 3½ inches to length for End Covers, except for Item 1 where Control Desk is fitted to 1 End Cover.

MISCELLANEOUS EQUIPMENT AND SUPPLIES

		Supplier	Specification	Price
Ampex Magnetic Tape		Minnesota Mining & Manufacturing Co., Ltd., 3M House, Wigmore Street, London, W.1.	½"-499-36IRC-Z3070	£22. 0. 0. nett (50 reels or over)
Decca Magnetic Tape		Decca Radar Ltd., Decca House, Albert Embankment, London, S.E.1.	½" Grade 2/NB Tested	£1. 0. 0. per 100 feet (usually 3,600 feet on spool)
New spool and container		"		£6. 10. 0.
Red & Green handles		"		£1. 6. 6. each
Recording Rings		"		£3. 10. 0. each
ANelex	Paper	J. Wilkes Ltd., 33 Cross Street, Manchester 3. (or London Office)	18" single ply .004" thick	Boxes of 1,000 continuous sheets £1. 15. 0. + 21⅓% P.T.
	Ribbon	Caribonum Ltd., Leyton, London, E.10.	160 WEB 17" (standard ink on litho ink)	15 yds silk £17. 17. 0. 12 yds nylon £10. 16. 0.
	Mylar Tape	Rollco Papers Limited, Leigh Hunt Street, London, S.E.1.	AL/275 x 1" with sprocket holes	1,000 feet £9. 12. 8. (shorter lengths pro-rata)
	Ultima-plus Tape	"	.004" caliper x 1"	1,000 feet £7. 4. 0. (shorter lengths pro-rata)
	Format Control Punch	Supplied with each ANelex Printer		
Rank Xeronic Line Printer	Paper	Direct through Ranks or Spicers Ltd., 19 New Bridge Street, London, E.C.4.	Xeronic Paper 26" wound on 3" O.D. Core	
Xeronic Form Head Cylinder		Ranks		Approx. £150. 0. 0. (in perspex)
Creed 75 Teleprinter	Paper	Percy Boyden Ltd., 5, Commerce Way, Waddon, Croydon, Surrey. or Calcutta Mill, Salop Street, Bolton, Lancs	Grade 'A' single ply 8½" x 3½" friction feed	25 rolls £9. 0. 0.
	Ribbons	Creed & Co., Ltd., (Spares), 19, Progress Way, Croydon, Surrey.	Model 75 Red/Black Heavy Inked	3/- each
Friden Flexowriter	Paper	As for Creed 75	As for Creed 75	As for Creed 75
	Ribbons	Friden Ltd., 101 Blackfriars Road, London, S.W.1.	Flexowriter Ribbon Black/Red, Nylon, Medium	£9. 4. 0. per doz.
Punch Paper Tape		Percy Boyden Ltd., 5, Commerce Way, Waddon, Croydon or Calcutta Mill, Salop St. Bolton, Lancs.	Paper Tape Abast 11/16" 5 track ⅞" 6 or 7 track 1" 8 track	2/10 per roll
Tape Boxes (Storage)		Punched Card Accessories 58, Victoria Street, London, S.W.1.	5" x 5" x 1" Ref. 551/HL	7d each (plus carriage)
Punch Cards		I.C.T. Ltd., Gloucester House, 149, Old Park Lane, London, W.1.	Single Sided	12/- to 22/- per 1,000 (varies inversely according to quantity)
Temperature & Humidity Monitor		C. F. Casella & Co., Ltd., Regent House, Brittania Walk, London N.1.	Thermo-Hygrograph Weekly, Type T.9154 Temp. Range 20-120° F Humidity 0 - 100%	£31. 0. 0. each
	Tables	"	Fahrenheit Table T.8728	3/9 each
Hygrometer (for checking)		"	Whirling Hygrometer 20/120°F Type T.8700/20	£3. 12. 6. each

AEI 1010 Computer System

AEI

The AEI 1010 Computer System is a reliable, low-cost, powerful and flexible data-processing system of advanced design.

Solid-state circuits — transistors, ferrite magnetic cores and printed circuit boards — give maximum system reliability and ease of maintenance.

The high speed of the Central Processor — $3\frac{1}{2}$ micro-second storage access time — is further enhanced by the provision of simultaneous processing; overlapped data transfers to and from peripheral units with internal processing; and parallel programming features.

Existing programme control routines provide for four programmes running in parallel with up to nine simultaneous programme branches.

Priority processes may interrupt the main routines to execute urgent tasks without delay, automatically reverting to the main routine afterwards.

Comprehensive control programme and subroutine library for all standard data processing and mathematical work are supplied to AEI 1010 users.

Modular design permits the assembly of an economical system, tailored to your current needs. Extra units are added on site, without modification of the basic computer, as your needs grow.

Up to 32 modules can be included in a system, using one or more of the following units:—

Central Processor	4096 words of working store and 16,284 or 8192 words of backing store.
Auxiliary Core Store	4096 word blocks.
Magnetic Drum Store	8192 word drums.
Magnetic Tape Units	45,000 or 10,000 characters per second.
Line Printers	3000 or 1000 lines per minute.
Typewriters	Ten characters print per second; manual input.
Paper Tape Reader	1000 characters per second.
Punched Card Reader	370 80-column cards per minute.
Card Punch	100 80-column cards per minute.
Supervisor's Control Desk	and Display Unit.

Operating Controls

CONTROLS

Operation of the AEI 1010 Computer from the Control Desk is by sets of hand keys, selector switches and push buttons.

HAND KEYS

There are two rows, each of 22 hand keys corresponding to a 44-digit word. The most significant digit is on the left and the most significant half-word is the top row. Each of the hand keys locks in position and is reset individually.

SELECTOR SWITCHES

The manual transfer of numbers into registers is achieved by setting-up the necessary hand keys, selecting the register required on one of two selector switches and then operating the associated "TRANSFER" push button. Clearing of the register may be achieved by pressing the "CLEAR" push button.

One of the selector switches has positions M, D, E, S, W and LAS (Long Adder-Subtractor), and the other has postions C, B(r), B(o), A, and SAS (Short Adder-Subtractor). Register A is used only in the internal logic of the computer.

The keys to be used for transfer are as follows:—

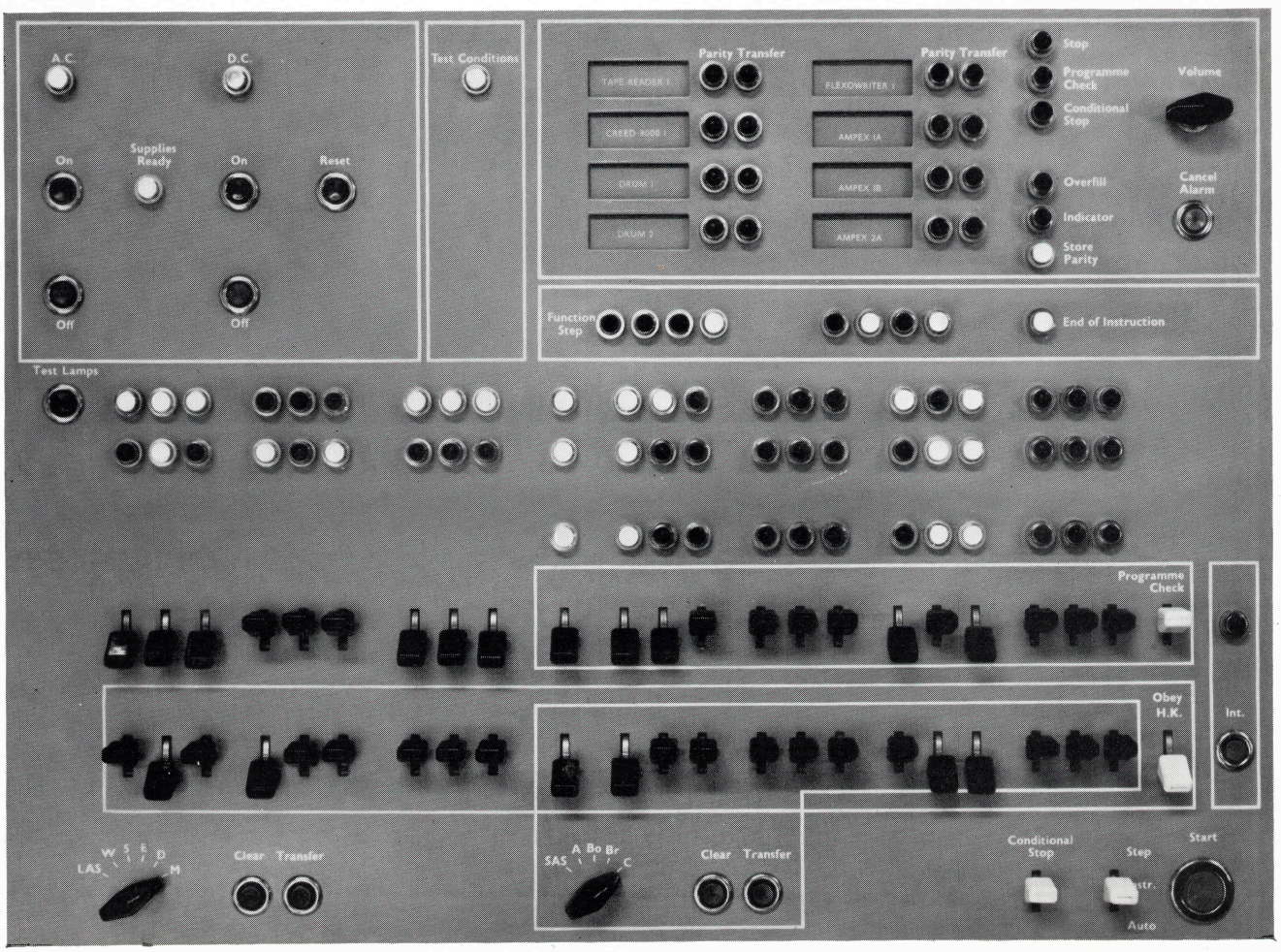
(*a*) M, D, E, S, LAS — All 44 keys.

(*b*) W — the least significant nine keys, i.e., the left-hand nine keys of the top row.

(*c*) A, B(o), B(r), C, SAS — the least significant 13 keys, i.e., the right-hand 13 keys of the bottom row.

OBEY HAND KEYS

An "OBEY HAND KEYS" key causes the instruction set up on the lower row of 22 hand keys to be obeyed



when the start button is pressed. If the machine is set in automatic operation this instruction will be continuously obeyed.

START BUTTON

A push-button causes the computer to obey the instruction at the address in the control register if the "OBEY HAND KEYS" key is not depressed.

INDICATORS

Long Registers

A set of 44 lamps indicates the contents of a selected register by the operation of a selector switch marked M, D, E, S, W and LAS (Long Adder-Subtractor). These lamps actually monitor the output of the arithmetic unit during machine operations, and the action of the switch allows the appropriate register to be switched into the input of the arithmetic unit when the machine is stopped.

Short Registers

A set of 13 lamps is provided to show the contents of the short registers, C, B(r), B(o), A and SAS (Short Adder-Subtractor), in a similar way.

FUNCTIONS

A set of eight lamps indicates the function and step in operation at the time. A ninth lamp indicates that the final step of an instruction has been completed.

OVERFILL

The overfill lamp will light whenever overfill occurs in the long arithmetic unit. This indication is cancelled by Function 8 or the "RESET" button. The computer will stop automatically unless the instruction following that in which overfill occurred is Function 8.

WORKING STORE PARITY

A lamp indicates a parity error on transfer of information from the working store. The computer stops when this indication is given.

INDICATOR

A lamp lights up when the Indicator is set as in the queries to ancillary equipments. The lamp extinguishes when the Indicator is reset, e.g., by Function 8. The computer will stop automatically unless the instruction following that in which the indicator was set is Function 8.

TRANSFER

Where less than nine items of ancillary equipment are in use, eight lamps on the control desk give indication of the state of the parity check on each item of equipment. A further eight lamps indicate a failure to transfer information due to the condition of the ancillary equipment, e.g., stationery run out, broken tape, etc.

Where more than eight items of ancillary equipment have to be controlled a Supervisor's Display must be used. This provides indications for up to 32 pieces of ancillary equipment.

SINGLE STEP, SINGLE INSTRUCTION, AUTOMATIC KEY

A three-position key allows the computer to operate, automatically, instruction by instruction, or step by step. This last position provides an engineering facility for the computer to move through the individual steps of an instruction by pressing the "START" button.

The automatic stop position of the computer is where an instruction has just been completed and the next instruction is about to be extracted. When the computer is running automatically and the three-position switch is changed from "AUTOMATIC" to "SINGLE INSTRUCTION", the computer will stop at the end of an instruction. If the "START" button is now pressed the computer will move on to the position immediately after extraction of the next instruction and successive operations of the "START" button will cause the computer to move on each time to a similar condition.

STOP

The AEI 1010 instruction code offers three kinds of programmed stop, namely:—

Absolute Stop —Function 64 causes the computer to stop unconditionally.

Conditional Stop —Setting of the "CONDITIONAL STOP" key will cause the computer to stop whenever Function 65 occurs.

Programme Check—Depression of the "PROGRAMME CHECK" key will cause the computer to stop when the contents of the control register C agree with the 13 least significant digits set on the top row of the hand keys.

The computer will also stop if working store parity fails, if the Indicator is set, or if overfill occurs.

Separate lamp indications are given for each of these six cases.

Whenever the computer stops, the stopping is not complete until all ancillary equipments have completed their block transfers, and until this state is reached, the "START" button is ineffective.

This will ensure that no matter how the machine is stopped it will not be necessary to recover further information from the ancillary equipment when restarting. When the computer stops while in automatic operation, an alarm tone is sounded.

RESET

Operation of the "RESET" button resets the overfill indicator to the off position, and resets the computer to the beginning of the current instruction.

INTERRUPT

An "INTERRUPT" push button sets a circuit which causes a lamp to be lit and the condition of this circuit

Programming

The AEI 1010 Data Processing System has an extremely wide range of instructions designed to give maximum flexibility in the use of the system in greatly varying applications. A full list of fixed point and floating point arithmetic instructions is available, as well as a comprehensive set of organisational instructions.

The computer has been designed to undertake parallel programming; that is to say, more than one programme may be run, in interleaved fashion, at the same time. This is done by controlling all transfers of information by a central housekeeping routine known as the "Programme Switch". When one programme is held up while a transfer of information is taking place, control is passed automatically to another programme by "Programme Switch", which also supervises the allocation of space in the working store and on the magnetic drum backing stores.

COMPUTER REGISTERS M, D, E, C, B.

The two main accumulators of the computer are referred to as M and D. They are each 44 binary digits in length, the most significant digit in both being used as a sign digit. In addition to being used separately, M and D may be used together as an 87 binary digit register with the sign digit of D suppressed.

The combined register is used in multiplication and division. The two natural ranges of the computer are, for integers, between $2^{43}-1$ and -2^{43}, and for fractions, between $1-2^{-43}$ and -1.

For floating point arithmetic, which is carried out in accumulator M, the 36 most significant digits are used for the argument and the eight remaining digits for the exponent. The most significant digit of each part is used as a sign digit. A floating point number, $x.2^y$ is always kept in standard form with the argument in the range $\frac{1}{2} \leqslant |x| < 1$, and the exponent y in the range $128 > y \geqslant -128$. Zero is always represented with argument 0 and exponent -128.

The E register is a special 44 binary digit register used for holding the multiplier in accumulative multiplication.

The C register is a 13 binary digit control register, which is used for selecting the next instruction to be obeyed from the working store.

The B registers are eight registers each of 13 binary digits in length. B(1) to B(7) are used in the conventional way for address modification. B(0) is a special modification register used to provide a double modification of addresses in conjunction with the conventional B registers. All functions between 1 and 61 inclusive, with the exception of functions 14 to 19 and 36 to 38, have their addresses automatically modified by the contents of B(0), i.e. all instructions using a working store address except "Unconditional Jump". This is in addition to any modifications that may be specified by B(1) to B(7).

By use of this unique facility, programmes and subroutines can be placed anywhere in the working store and obeyed without changing any of the addresses in the subroutines or programme. This is a tremendous simplification for the programmer, who no longer has to consider absolute addresses and can write his subprogrammes in such a form that they can be incorporated in any place in any programme.

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Checking Facilities

Parity checks and similar tests are made to test the accuracy of data read from the working store, ancillary core store, magnetic drum, magnetic tape stores, and, wherever possible, on the standard input and output equipment.

WORKING STORE

There is a parity check on each group of 11 digits read from the working stores. Two of these groups of 11 digits make up one instruction and four groups make up one computer word.

TRANSFERS

Parity checks on each block transferred out of auxiliary storage are made and failure to complete a transfer is indicated.

ARITHMETIC

An indication is given when any arithmetic operation gives rise to a number that is outside the range of the machine.

MAGNETIC TAPE

For each block transferred from magnetic tape to the working store, there is both a transverse parity circuit to check the correctness of each character and a longitudinal parity counter which counts up the digits along each track, providing a check at the end of each block after writing, by a separate checking station.

PROGRAMME

A programme may be stopped on any given instruction for checking purposes and functions are provided to allow automatic action to be taken when parity errors etc., are discovered.

Central processor

The Central Processor contains the control and arithmetic circuits and the high-speed ferrite core working store.

Word length is 44 binary digits, equivalent to a 14-digit decimal number or seven alphabetic characters. A further four bits supply parity checks on transfers.

For arithmetic and all data transfers, whole words are transmitted in parallel.

Both fixed and floating point arithmetic is provided as standard.

Eight B-registers provide for automatic address modification, automatic programme relocation and short-word arithmetic.

The working store is 4096 words of magnetic ferrite core memory with an access time of only $3\frac{1}{2}$ micro-seconds. Auxiliary modules of 4096 words are optional and may be field-installed.

The backing store is 16,284 or 8192 words of magnetic drum memory with average access time of ten milliseconds. Auxiliary modules of 8192 words are optional and may be field-installed.

Simultaneous processing is achieved by advanced circuit techniques:

Long instructions (e.g. multiply, divide) may be overlapped with short instructions (e.g. logic or B-register instructions).

Transfers to and from the on-line peripheral units are executed while internal processing proceeds.

High internal speeds allow full use of several peripheral units simultaneously.

Overlapping of process functions and priority sequencing, under control of the Data Scanner, allows the operation of parallel programmes and parallel branches within the same programme.

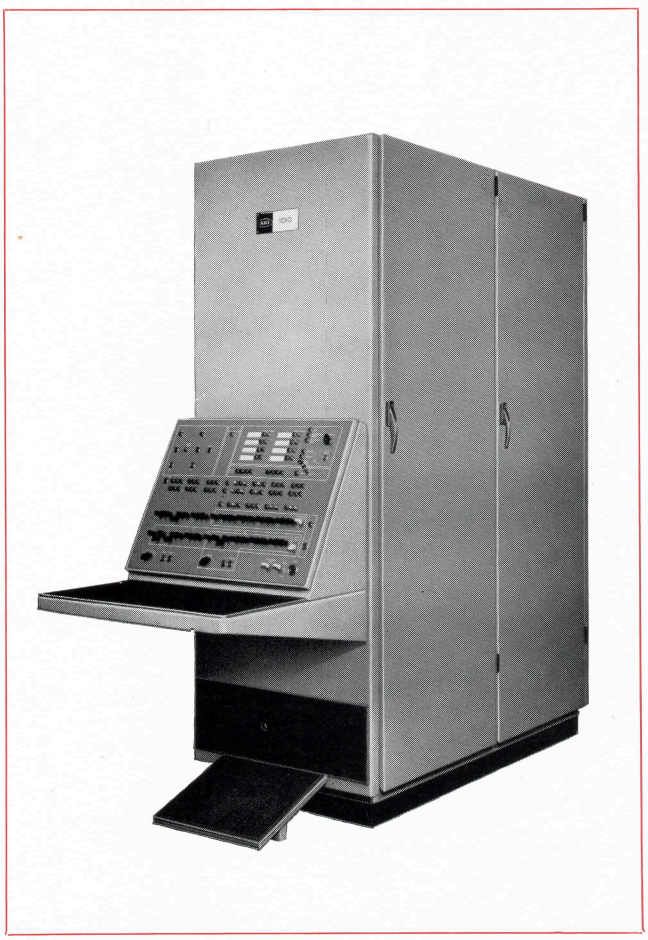
Optimum utilisation planning is simplified by the Housekeeping Routine executive programme, which reports the amount of unused processing time under each given combination of programmes in parallel.

Instructions are single-address, of one half-word length, so that two instructions are stored in each memory location.

A fully comprehensive and powerful set of functions is provided — 80 in all, exclusive of macro-instructions and subroutines in the Housekeeping Routine Library.

Typical instruction execution times are:—

Add/Subtract	$18\frac{1}{2}$ microseconds
Add quantity to B-register	$12\frac{1}{2}$ microseconds
Jump if accumulator non-zero	$12\frac{1}{2}$ microseconds
Add quantity to control register and jump	$18\frac{1}{2}$ microseconds
Collate (mask)	$18\frac{1}{2}$ microseconds
Count loop, test and jump	$12\frac{1}{2}$ microseconds
Add constant to B-register	23 microseconds
Initiate transfer 32-word block to peripheral	23 microseconds
Multiply	89-243 microseconds
Divide	263 microseconds



AEI

Auxiliary core storage

Modules of 4,096 words of auxiliary ferrite core storage may be connected to the AEI 1010 System to provide large capacity additional high-speed storage.
Data is stored in blocks of 32 words, and each block is individually addressable.
Each transfer instruction moves a block of 32 words into or out of the central processor working store. All data transferred from auxiliary store is subjected to parity check to verify accuracy of data recovery.
Access time for one block of 32 words is 424 microseconds, i.e., 32 cycles of the data scanner.

AEI

Enquiry typewriter

FRIDEN FLEXOWRITER

One or more Friden Flexowriters may be connected to the AEI 1010 System to provide direct communication with the computer and auxiliary printing facilities on-line and off-line.

The Flexowriter incorporates a paper tape read-punch unit. Automatic format control of on-line printing is provided by feeding a prepunched tape into the read-punch unit. Automatic off-line printing, combined with manual typing if desired, is also provided by the read-punch unit.

Punched paper tape may be prepared on the read-punch unit from data entered manually on the keyboard. An isolate button provides for off-line operation without the need for physical disconnection from the AEI 1010 System.

A full range of alphabetic and decimal characters is available and there are 23 symbols. Typing may be in upper or lower case and red or black under programme, manual or paper-tape control.

Data input, via the keyboard, is at manual speed.

Automatic printing from paper tape or computer output is at the rate of 10 characters per second.

AEI

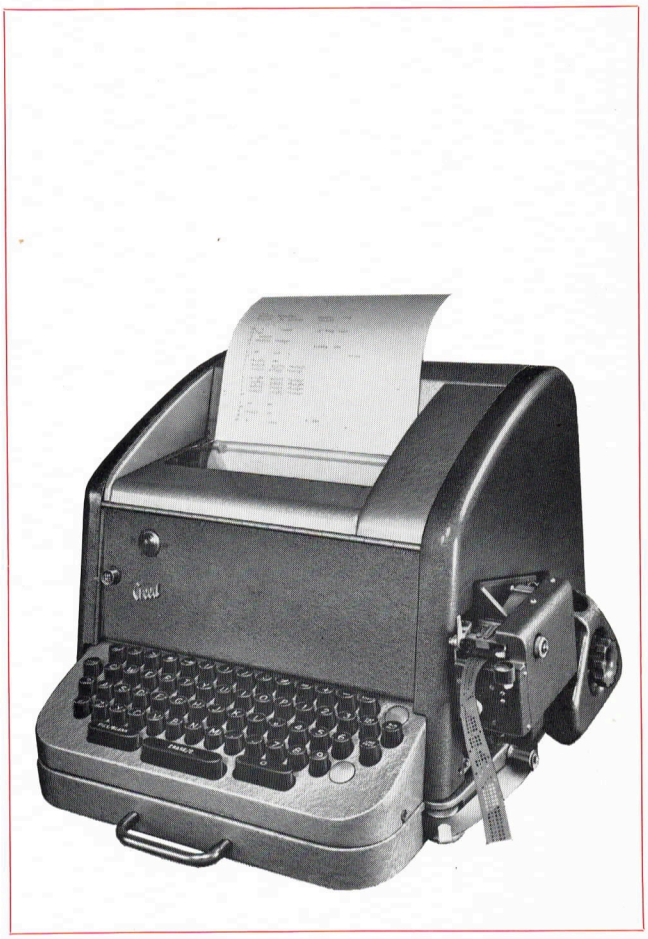
Enquiry typewriter

CREED TYPE 75

One or more Creed Type 75 Teleprinters may be connected to the AEI 1010 system to provide direct communication with the computer. One teleprinter will normally be reserved to print the operating log. Further teleprinters may be added to provide low-volume printed output, e.g., lists of exceptions.

Data input, via the keyboard, is at manual speed. An interrupt button is provided to prepare the central processor for acceptance of an input message.

Printing output from the computer is at the rate of ten characters per second.



AEI

Magnetic drum store

TYPE CDM 2

Two 8,192 word magnetic drum stores are normally supplied with each AEI 1010 System to provide 16,384 words of backing store. Further magnetic drums of 8,192 word capacity may be connected as required.

Data is stored in 32-word blocks, and there are 256 blocks per drum, individually addressable by the computer programme.

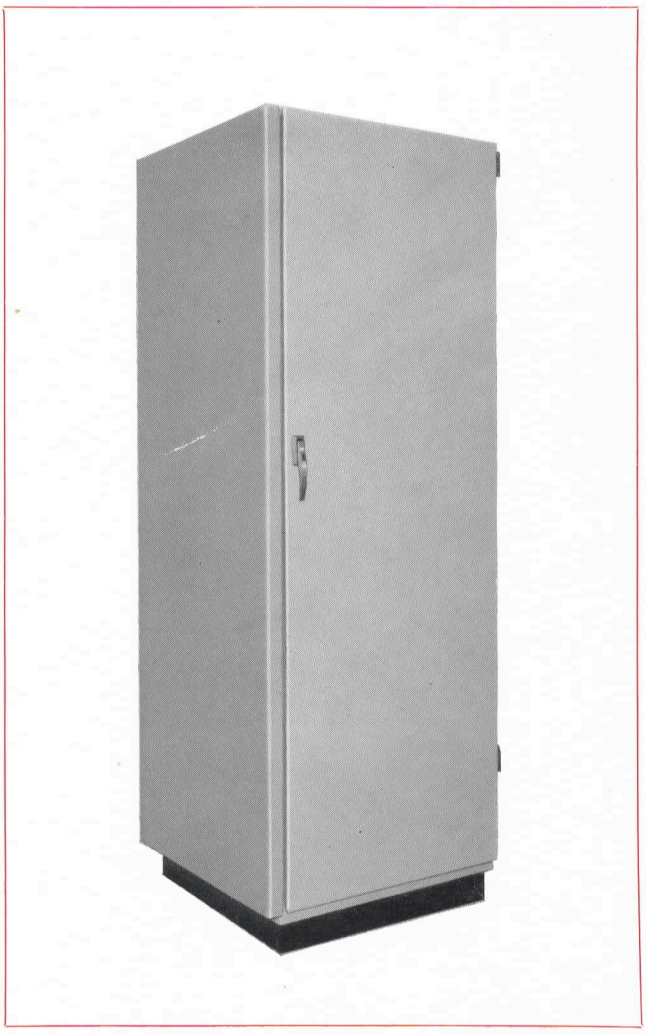
Average access time to a block of data is 10 milliseconds.

Transfer time for a block of data to or from the drum is 10 milliseconds.

Automatic parity check on reading from the drum verifies accuracy of data recovery.

Each transfer instruction causes a full block of 32 words to be transferred directly between the drum and working store.

The AEI 1010 programme library contains a subroutine for executing transfers of data held in several successive blocks of the drum/working store.



AEI

Magnetic tape unit

AMPEX TYPE TM2

The Ampex TM2 Magnetic Tape Unit adds high-density, high-speed magnetic tape files to the AEI 1010 Computer System.

Any number of magnetic tape units may be connected, within the limit of 32 modules maximum for an AEI 1010 Computer System.

The magnetic tapes are ½-inch wide, Mylar based, oxide coated and record eight channels. Six data tracks accommodate one alphanumeric character or six binary digits in each frame. One track is reserved for a parity check on each frame and one track is a marker to give positive indication of frame location.

Data is recorded at a density of 375 frames per inch in blocks of 32 computer words each.

Reels accommodate up to 3600 feet of tape, allowing up to 29,300 32-word blocks to be contained in one reel.

Reading and writing is executed at 120 inches per second, i.e., a data transfer rate of 45 characters per millisecond.

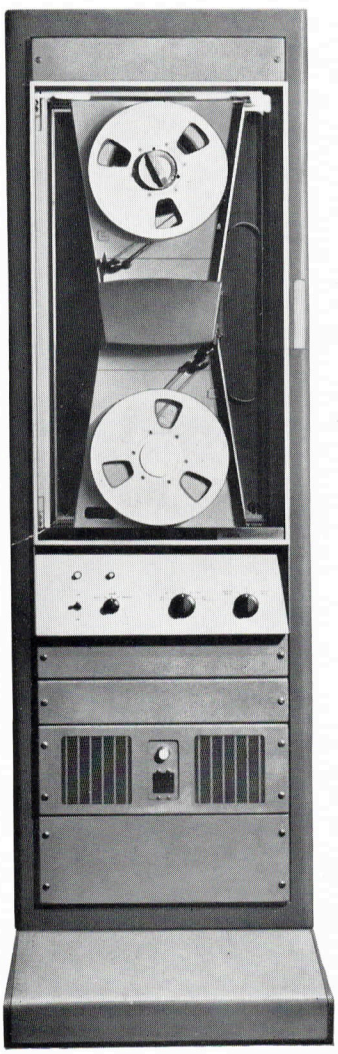
Successive blocks are read or written at 14·5 milliseconds per block, including the parity check for accuracy.

Rewind speed is 240 inches per second.

End of file indication is provided for by a silvered marker, read photoelectrically. The marker also serves to locate tape in loading and rewinding operations.

File protect rings prevent accidental writing on tapes used as master files or during programme testing.

Reading and writing magnetic tape proceeds independently of internal computer processing after an initial instruction time of 23 microseconds. Under control of the Data Scanner, the 32-word blocks of data are transferred directly from/to working store, when they are immediately available for processing.



AEI

Magnetic tape unit

DECCA TWIN TYPE 3000

The Decca Twin Tape Unit, Type 3000, consists of two independent magnetic tape transports, housed in one compact unit.

Any number of magnetic tape units may be connected, within the limit of 32 modules maximum for an AEI 1010 Computer System.

The magnetic tapes are $\frac{1}{2}$ inch wide, Mylar based, oxide coated and record eight channels. Six data tracks accommodate one alphanumeric character or six binary digits in each frame. One track is reserved for a parity check on each frame and one track is a marker to give positive indication of frame location.

Data is recorded at a density of 100 frames per inch in blocks of 32 computer words each.

Reels accommodate up to 3600 feet of tape, allowing up to 12,000 32-word blocks of data to be contained in one reel.

Reading and writing is executed at 104 inches per second, i.e., a data transfer rate of 10·5 characters per millisecond. Successive blocks are read or written at 40 milliseconds per block, including the parity check for accuracy.

End of file indication is provided for by transparent markers, read photoelectrically. The marker also serves to locate tape in loading and rewinding operations.

File-protect rings prevent accidental writing on tapes used as master files or during program testing.

Reading and writing magnetic tape proceeds independently of internal computer processing after an initial instruction time of 23 microseconds.

Under control of the Data Scanner, the 32-word blocks of data are transferred directly from/to working store, where they are immediately available for processing.

AEI

Paper tape reader

TYPE CRP 1

The AEI Paper Tape Reader Type CRP1 is a robust, high-speed input unit for data recorded on punched paper tape. One or more may be connected to the AEI 1010 System.

Paper tape of $\frac{11}{16}$, $\frac{7}{8}$ or 1 inch width may be used.

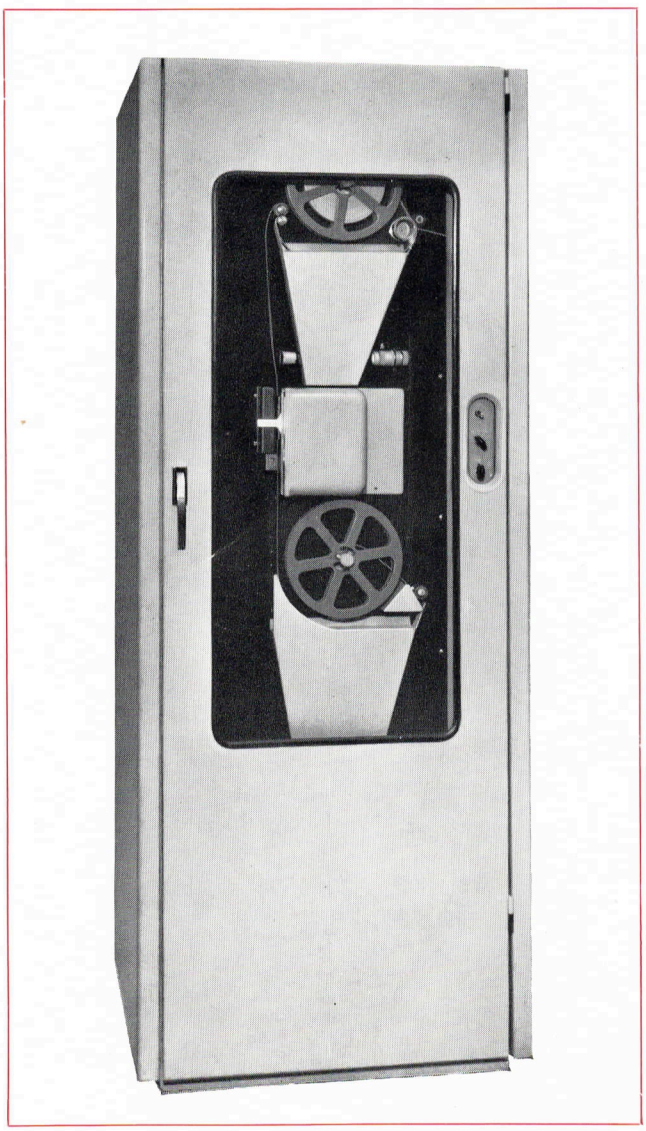
Punching may be in five, six, seven or eight channels.

The spooling mechanism provides for long reels of tape. Short lengths, unspooled, may also be read.

Reading speed is 1000 characters per second, unless programmed for intermittent operation.

Blocks of 64 characters are transferred directly into the AEI 1010 working store, where they are immediately ready for processing. Two characters are stored in image form in each computer word and the block of 64 characters occupies 32 words of storage.

The AEI 1010 programme library contains a subroutine for converting standard codes automatically for alphabetic, decimal and £ sterling data. The programme subroutine provides for dealing with paper tape field by field.



AEI

Paper tape punch

CREED 3000

The Creed 3000 Paper Tape Punch provides a means of output for data transmission or for input to off-line devices such as the Flexowriter or machine tool control instruments using paper tape medium.

Paper tape with five, six, or seven channels may be punched with any code.

Two models are available, punching:—

five channels on $\frac{11}{16}$ inch tape.

six or seven channels on $\frac{7}{8}$ inch tape.

The tape supply and spooling mechanisms are motor driven and the tape is automatically maintained at the correct tension.

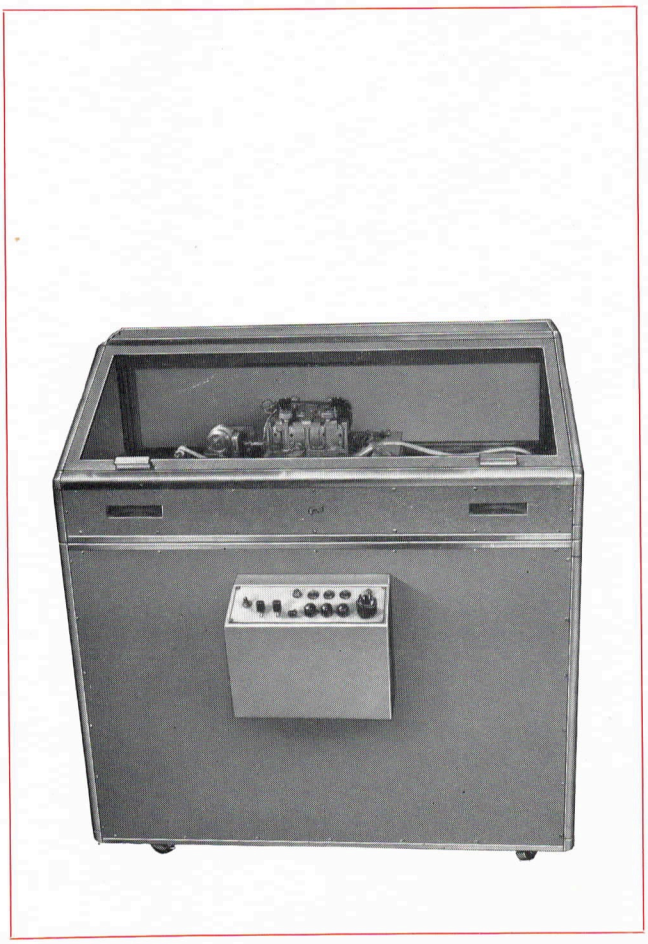
Punching rate is 300 characters per second.

A check read device verifies accuracy of punching. A tape low-warning device is fitted.

A single block transfer of 32 computer words causes 192 characters to be punched from working store, where the characters are stored six to a word.

The AEI 1010 programme library contains a subroutine for converting computer code into alphabetic characters, decimal or £ sterling etc. automatically.

The programme also provides for specifying output field by field and, when the tape is intended for printed output, for printing format.



AEI

Punched card reader

ELLIOTT B46

One or more card readers may be connected to the AEI 1010 System.

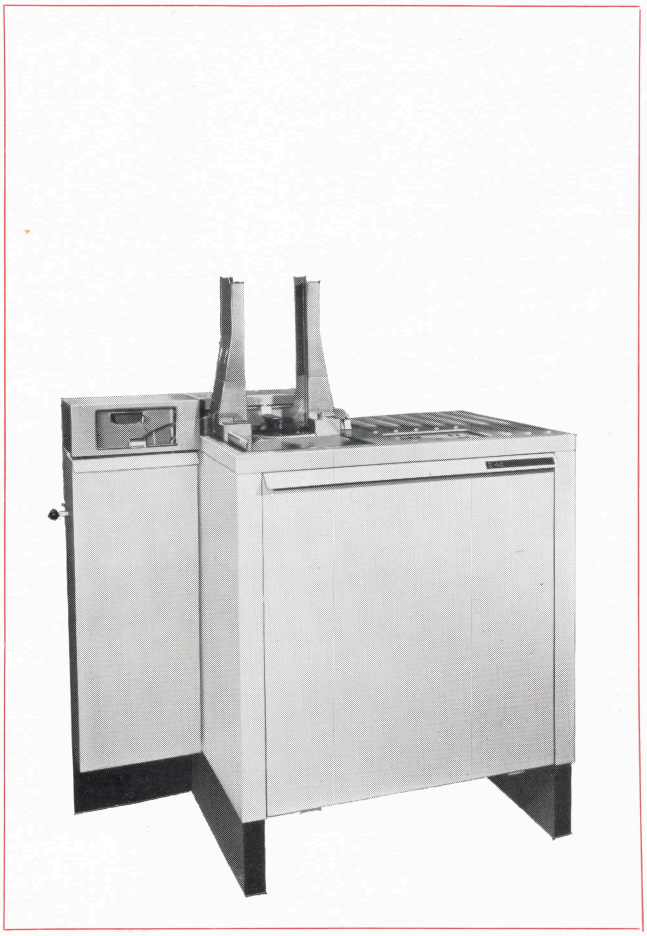
Photo-electric sensing permits 80-column cards punched with either round or rectangular holes in normal stage, to be used.

Maximum reading speed is 400 cards per minute, obtained when the read instruction is given not later than the middle of the preceding card cycle or 340 cards per minute otherwise. An average rate of 370 cards per minute is normally achieved.

The magazine holds 2,000 cards.

Each computer read instruction causes two cards to be read and the data transferred directly into the AEI 1010 working store, where they are immediately ready for processing. The card codes are translated into 7 binary-bit representation and the block of 160 characters occupies 28 words of storage.

The AEI 1010 programme library contains a subroutine for handling information read from punched cards field by field. It will convert automatically alphabetic, decimal, £ sterling and avoirdupois data.

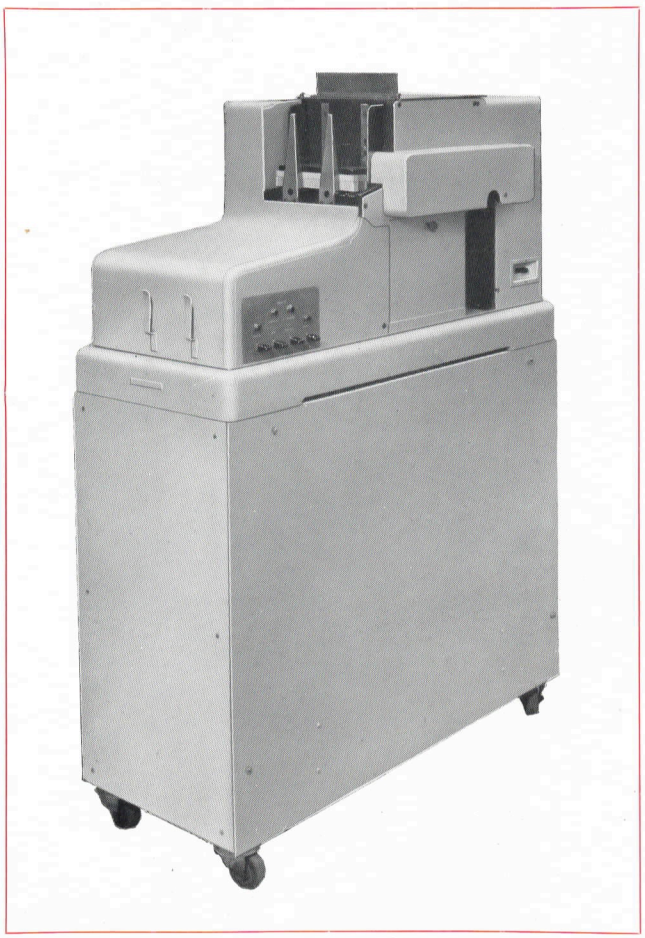


AEI

Output card punch

ICT TYPE 582

One or more card punches may be connected to the AEI 1010 System.
80-column cards with rectangular punched holes are used.
Punching rate is 100 cards per minute.
The magazine holds 800 cards.
Cards are punched from an image held in 24 words of working store.
The AEI 1010 programme library contains a subroutine for assembling data for punched card output field by field. It will convert automatically alphabetic, decimal, £ sterling and avoirdupois data.



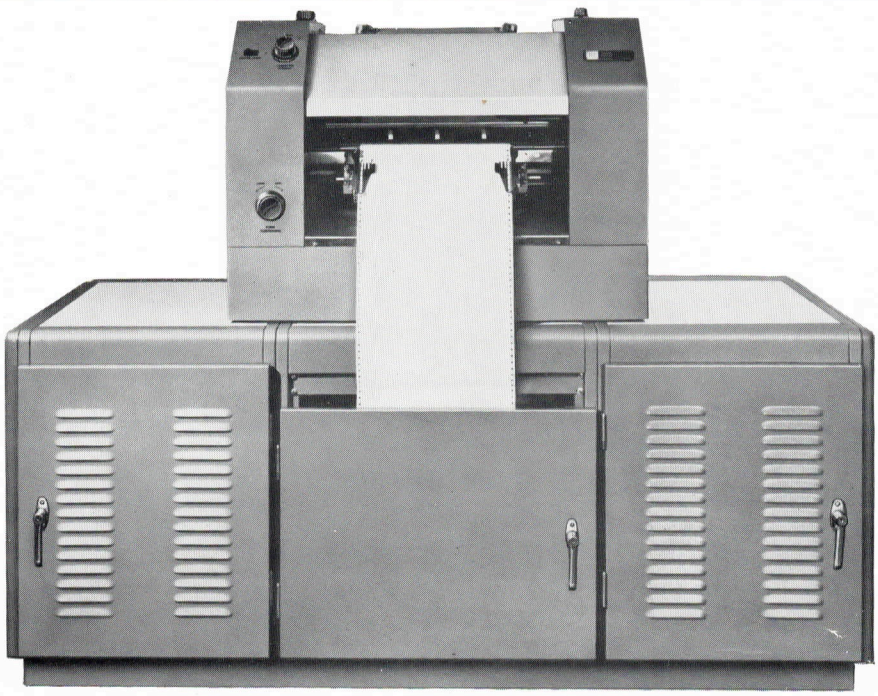
AEI

High speed printer

ANelex 4-1000

The ANelex Printer provides the main printed output facility of the AEI 1010 System. Two or more may be connected where very large amounts of printing are required.
Each print position can be supplied with up to 63 characters.
Line length is 160 characters at ten characters per inch on stationery up to 19 inches wide.

Printing speed is 1000 lines per minute maximum.
Automatic head of form positioning is available for forms up to 17 inches deep. Programmed skips up to 62 lines are provided for.
A penetration control feature allows the operator to adjust the hammer throw to suit different types of stationery.



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